4-2010

Bottled Water: Know the Facts

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Bottled Water

Know the Facts

Why do we need water?

Water has several essential roles:

- Water is present in all tissues.
  - Blood is 92 percent water.
  - Muscles are 75 percent water.
  - The brain is 75 percent water.
  - Bones are 25 percent water.
- Water regulates body temperature.
  When a person is too hot, the body sweats. When sweat evaporates, it lowers the body temperature.
- Water helps the body absorb nutrients and then carry nutrients and oxygen to all cells in the body.
- Water moistens oxygen for breathing.
  The lungs require approximately 2 glasses (16 ounces) of water a day to function properly.
- Water protects and cushions vital organs and joints.
- Water helps remove waste products from the body.
  Some waste products are toxic or can impair physical performance (i.e. urea and lactic acid) if they are not removed from body tissues and fluids.

Water also is a preferred beverage choice because it is readily accessible; contains no calories, fat, or cholesterol; and is low in sodium.

How much water do you need?

The body can survive for up to 6 weeks without food but it can last only 1 week without water. The Dietary Reference Intake (DRI) for water was released in 2004. According to the DRI, the majority of healthy people can adequately meet their daily water needs by letting thirst be their guide; however, some groups cannot rely on thirst to maintain adequate hydration—specifically athletes and older adults.

Athletes or physically active individuals have elevated water requirements. Additional water is needed to provide a medium for reactions to release energy, transport nutrients, cool the body, lubricate joints, and remove waste products.

In the case of older adults, water needs are not increased. Older adults are at risk for dehydration because their thirst mechanism may not be working optimally, and some voluntarily abstain from drinking due to concerns about incontinence.

Dietary Reference Intakes: Daily Water Recommendations

Life Stage Group	Males Liters/8 oz cups	Females Liters/8 oz cups
9-13 years	2.4 L / 10 cups	2.1 L / 8.75 cups
14-18 years	3.3 L / 13.75 cups	2.3 L / 9.5 cups
19+ years	3.7 L / 15.5 cups	2.7 L / 11.25 cups

Healthy individuals need approximately 10 to 15 cups of water each day. About 80 percent (8 to 12 cups) comes from drinking water and other beverages, including caffeinated beverages. Most recent research suggests that caffeine does not consistently cause fluid loss (diuresis) as previously thought. Therefore, caffeinated beverages do contribute to total fluid intake. The remaining 20 percent (2 to 3 cups) comes from eating foods, such as fruits and vegetables. As much as 70 to 90 percent of some fruits and vegetables are water.

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PM 1813 Revised April 2010

The more active you are the more water you need

Feeling thirsty is more than a simple signal that your body needs water. Thirst is actually one of the first signs of dehydration. Research suggests that thirst will only replace 50 to 70 percent of actual fluid needs in physically active individuals. As a rule, 4 to 6 ounces of water should be consumed every 10 to 15 minutes of activity. In addition, weight should be monitored before and after activity; consume 3 cups of water for every pound of weight lost during activity. Water is the best fluid for activities lasting less than 60 minutes of continuous duration. For activities lasting longer than 60 minutes, a fluid replacement drink that contains carbohydrate, sodium, and potassium should be used.

The following guidelines should be followed to ensure adequate replacement of fluids lost due to exercise:

- 2-3 hours prior to exercise, drink 17-22 ounces of fluid
- 10-15 minutes prior to exercise, drink 6-10 ounces of fluid
- Every 10-15 minutes during exercise, drink 6-10 ounces of fluid
- Replace every pound lost during exercise with 3 cups of fluid

Bottled versus tap?

Sales of bottled water have more than quadrupled in the last 10 years. Bottled water is now the second leading beverage in sales, with soda still being the first. Most consumers choose bottled water for convenience, taste, and/or perceived health benefits. Marketing campaigns, advertisements, and package labels showing pristine glaciers and crystal-clear mountain springs have created a public perception that bottled water is "purer" and "healthier" than tap water.

However, the truth is that bottled water sold in the United States is not necessarily cleaner or safer than most tap water. Most bottled water comes from the same municipal water supplies as tap water. The National Resources Defense Council (1999) reported that 25 percent or more of bottled water is really just tap water–sometimes further treated, sometimes not.

Because bottled water is considered a food, it falls under the U.S. Food and Drug Administration (FDA). The FDA bottled water quality standards are less stringent than those governing local water treatment plants, which are under the U.S. Environmental Protection Agency (EPA).

Some Key Differences Between EPA Tap Water and FDA Bottled Water Rules

	Water Type	
	Bottled Water	**Municipal Tap Water**
Requires disinfection	No	Yes
Testing frequency for bacteria	1/week	Hundreds/month
Requires filter to remove pathogens, or strictly protected	No	No
Requires test for Cryptosporidium, Giardia, viruses	Yes	Yes
Testing frequency for most synthetic organic chemicals	1/year	1/quarter (limited waivers available if clean source)

Source: The National Resources Defense Council (NRDC) (1999)

Public health officials also are concerned about the lack of fluoridation in bottled water, which is required of tap water. This difference in requirements may be linked to the growing prevalence of cavities among youth.

Bottled water also has a higher cost to the consumer and the environment. Consuming daily fluid requirements (10 cups) would cost approximately $1,764 annually per person. The Earth Policy Institute suggests that bottled water costs as much as 10,000 times as much as tap water—that's as much as $2.50 per liter ($10 per gallon) more than the price of gasoline. Some of this cost is contributed by the packaging and transportation of bottled water. Plastic bottles used for bottled water are derived from crude oil. The U.S. demand for bottled water requires more than 1.5 million barrels of oil annually just to produce the plastic bottles. That is enough fuel for 100,000 cars annually. In addition, most bottled water is transported to various markets, using additional resources of crude oil.

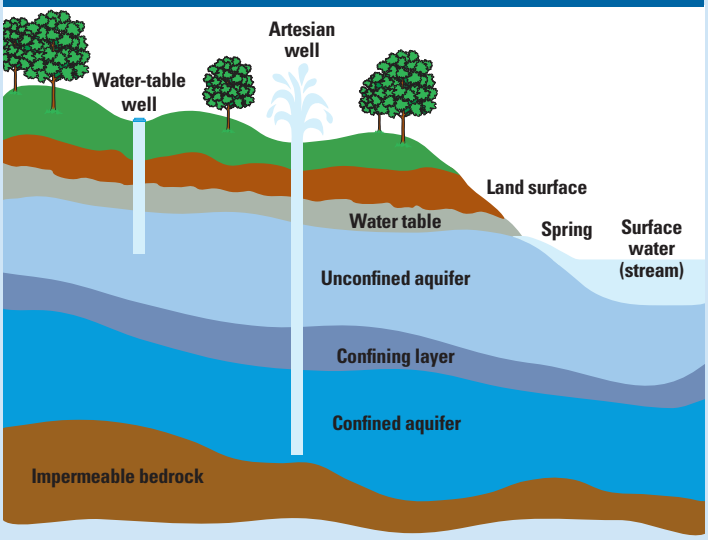
Those concerned about the cost of bottled water, both financial and environmental, are encouraged to fill reusable water bottles. Washing reusable bottles in the dishwasher will prevent bacterial growth.

The FDA defines the following types of bottled water.

Type	Definition
Artesian Water	Water from a well tapping a confined aquifer in which the water level stands at some height above the top of the aquifer.
Mineral Water	Water containing not less than 250 ppm total dissolved solids that originates from a geologically and physically protected underground water source. Mineral water is characterized by constant levels and relative proportions of minerals and trace elements at the source. No minerals may be added to mineral water.
Purified Water	Water that is produced by distillation, deionization, reverse osmosis or other suitable processes and that meets the definition of "purified water" in the U.S. Pharmacopeia, 23d Revision, Jan. 1, 1995. As appropriate, also may be called "demineralized water," "deionized water," "distilled water," and "reverse osmosis water."
Sparkling Bottled Water	Water that, after treatment and possible replacement of carbon dioxide, contains the same amount of carbon dioxide that it had at emergence from the source.
Spring Water	Water derived from an underground formation from which water flows naturally to the surface of the earth at an identified location. Spring water may be collected at the spring or through a bore hole tapping the underground formation feeding the spring, but there are additional requirements for use of a bore hole.

(For complete regulatory definitions, see 21 CFR 165.110(a)(2).) **http://www.access.gpo.gov/nara/cfr/waisidx_03/21cfr165_03.html**

The Origins of Bottled Water



Tips for buying and storing bottled water:

1) Read the label. It should say "bottled at the source" and specify a location of the source. Unless the location is indicated on the label, "spring water" could be tap water with minerals added to improve taste.

2) Check the mineral content. Ideally, water is high in magnesium (> 90 mg/L) and calcium (twice the amount of magnesium) and low in sodium (< 10 mg/L).

3) If bottled water is constantly used to prepare infant formula, check the water's fluoride content. If the amount is low (<1 mg/L), dietary fluoride supplementation may be necessary to ensure normal tooth development.

4) Check for the words "Member of IBWA," which is a guarantee that levels of contaminant, if any, are below the FDA standards. However, even if the bottler is not a member of IBWA, the product may still be safe and of good quality.

5) Whenever possible, buy refrigerated bottled water and keep it refrigerated. Storage at or above room temperature promotes bacterial growth and increases leaching of plastic contaminants from the container into the water.

6) Carbonated (sparkling) water contains fewer bacteria due to the increase in acidity that occurs with carbonation.

7) Reusing plastic water bottles. The safety of reusing plastic bottles/containers intended for one-time use has been subject of many myths. The FDA considers polyethylene terephthalate (#1 appearing in the recycling triangle on the bottom of the container) safe for repeated use. Proper cleaning between uses is the key to the safe reuse of these bottles. Bottles intended for reuse tend to have a larger opening, which makes cleaning easier. **http://www.plasticsinfo.org/s_plasticsinfo/sec_level2_faq.asp?CID=705&DID=2839&gclid=CLrl0p_ns58CFQUMDQodj0HW0w**

Tap Water Safety

One of the provisions of the Safe Drinking Water Act requires municipal water entities to provide an annual report to customers on contaminants in their drinking water. This annual water quality report (Consumer Confidence Report) is typically distributed by your municipality with your July water bill. You also can ask your local municipality for this report.

If you have a private water source (well), you are responsible for ensuring your water safety. Test water every year for total coliform bacteria, nitrates, total dissolved solids, and pH levels—especially if you have a new well, or have replaced or repaired pipes, pumps or the well casing. You may contact your local health department to have your water tested for bacteria or nitrates. For additional tests, you will need to locate a state certified laboratory.

You can find one in your area by calling the Safe Drinking Water Hotline at 800-426-4791 or visiting www.epa.gov/safewater/labs. Because the laboratory tests are expensive it is recommended that you limit tests to possible problems specific to your situation. The following table can help you determine which tests may be most appropriate for your situation.

When to Test Your Water

Conditions or Nearby Activities	Recommended Test
Conditions or nearby activities	Recommended Test
Recurrent gastrointestinal illnesses	Coliform bacteria
Household plumbing contains lead	pH, lead, copper
Radon in indoor air or region is radon rich	Radon
Scaly residues, soaps don't lather	Hardness
Water softener needed to treat hardness	Manganese, iron
Stained plumbing fixtures, laundry	Iron copper, manganese
Objectionable taste or smell	Hydrogen sulfide, corrosion, metals
Water appears cloudy, frothy, or colored	Color, detergents
Corrosion of pipes, plumbing	Corrosion, pH, lead
Rapid wear or water treatment equipment	pH, corrosion
Nearby areas of intensive agriculture	Nitrate, pesticides, coliform bacteria
Coal or other mining operation nearby	Metals, pH, corrosion
Gas drilling operation nearby	Chloride, sodium, barium, strontium
Odor of gasoline or fuel oil, and nearby bas station or buried fuel tanks	Volatile organic compounds (VOC)
Dump, junkyard, landfill, factory or dry-cleaning operation nearby	VOC, total dissolved solids (TDS), pH, sulfate, chloride, metals
Salty taste and seawater, or a heavily salted roadway nearby	Chloride, TDS, sodium

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